Meagre numbers raise genome questions

Mediawatch: Journalists puzzle over the results. Bernard Dixon reports

Journalists believe they do not work to agendas. They will report on therapeutic cloning one day and on its opponents the next, regardless of their own views. Nevertheless, strong agendas do on occasions dominate news coverage.

February's announcement of the human genome sequence is a case in point. On the Sunday before Celera Genomics published its version in *Science*, and the public consortium's version appeared in *Nature*, Robin McKie came out with a vividly clear message in *The Observer*. 'Revealed: the secret of human behaviour,' was the headline to his page one lead story. 'Environment, not genes, the key to life.' The article fleshed out those dramatic epigrams.

The piece was based on an interview with Celera's Craig Venter, at a Biovision conference in Lyon, on the imminent revelations. This was a scoop for McKie, because Venter leaked some of the key findings — in particular the recognition that the human genome contains not 80,000 or more genes as previously thought but only 30,000 or so.

"The discovery of our meagre gene numbers," wrote McKie, "reveals that environmental influences are vastly more powerful in shaping the way humans act." An accompanying editorial emphasised and extended the conclusion. "There simply aren't enough genes… to have one each for all the characteristics that have been associated with them, from alcoholism to criminality and intelligence."

Imagery, simile and metaphor are illuminating devices for getting across arcane scientific ideas

"Nurture, the scientists now suggest, is far more important than nature." The discovery offered "a vote of confidence in those who believe in the importance of nature and helping the young… But it is damning for the Right, with its fondness for ruling classes and original sin."

Without going to those extremes of simplistic extrapolation, most other newspapers echoed the

The Observer

THE AWARD-WINNING NEWSPAPER

NICOLE: WHY SHE LEFT TOM

The tensions that split the most powerful couple in Hollywood

PROFILE, PAGE 27

GOODBYE TO FAST FOOD

It's cheap, it's quick – but is it killing you?

FOCUS, PAGE 15

Revealed: the secret of human behaviour

Environment, not genes, key to our life

by Robin McKie
Science Editor

SCIENTISTS have made a radical breakthrough in our understanding of human behaviour with the discovery that we possess far fewer genes than previously thought.

code. Our environments are critical.'

Venter was speaking yesterday on the eve of the publication of the first analysis of the human genome sequence in science journals this week. *Nature* magazine is scheduled to outline the discoveries

ture – the fruit fly – we found it had about 13,000 genes, and we all thought, well we are much bigger and more complicated and so we must have a lot more genes. Now we find that we only have about twice what they have. It makes it a bit difficult to explain the human constitution.'

After seven months the search for Lucie is over

'Bil pay poo

by Gaby Hinsliff
Chief Political Cor

WORKING-class
be given piano l
classes and othe
perks of a middl
hood under a re
£35 million
'credit' to level
tional playing fie
Education Sec
Blunkett wants
make it up to the
standing at the
while their weal
are whisked off
school treats and
The 'Billy Elli
tion' aims to brid
with up to £360 p
some inner city
pay for activities
children's horizo
turing artistic tale
theatre visits, dr
or music lessons.
'These ideas a
contribution t
cash at your
schools who nee
do what better-
leafy suburban
are already all

Flagging up nurture: How London's *Observer* reported the sequencing of the human genome on its front page in an edition published last month.

anti-deterministic line. The tendency to follow-my-leader was probably enhanced by their need to follow-up a major Sunday story with their own articles on Monday. *The Times*, for example, explained "Why you can't judge a man by his genes." The reason was that the number of genes was "simply too small to support the idea that human beings are 'hard-wired' by the DNA they inherit from their parents."

Inevitably, the other main theme was dissent between Celera and the public consortium. "The two rival teams which mapped the human genome are arguing over the relative merits of their work on the eve of a joint statement about their work," said *The Times*. *The Guardian* went on to report 'bitter disagreement' concerning access to sequence data.

To some degree, *The Observer's* 'nurture, not nature' line also reflected contrasting perspectives within the rival camps. This was illustrated three days later when *The Daily Telegraph* published two short articles on the implications of their findings. One was by Craig Venter, who wrote: "The fruit fly genome has 13,000 genes and everyone thought that, because human beings are so much bigger and smarter, we should have a lot more."

"If you think we are hard wired — that is, everything is deterministic — there should be a lot more genes because we have a lot more traits. This makes me as a scientist both laugh and cry. I laugh at the absurdity of it and I want to cry because it is accepted by so much of our society."

The second article was by a member of the publicly funded effort, Sir John Sulston, who also criticised *The Observer's* line at a press conference accompanying publication of the *Nature* paper. Seeing no necessary contradiction between human complexity and the fact that we have barely double the number of genes found in flies and worms, he focussed instead on how the genetic material actually works. "One clue is that many of the additional genes are control genes," he wrote. "Like good executives in a growing organisation, they allow a more complex structure to be built from similar operational units."

Using similar imagery, *The Guardian* did a fine job in explaining what the two collaborations had achieved and how their work went beyond the 'rough draft' completed last June. As President Clinton described that as "the first survey of the entire human genome… the most wondrous map ever produced by humankind," this was not an easy task.

The Guardian saw "conflicting philosophies of science" in the two groups, reflected in differing methods of reading and searching coded material 'so huge that it would fill 750,000 pages of single-spaced typing'. "Our approach is like sending out 30,000 people across the world, each of whom is committed to mapping a little region," said Richard Durbin of the Sanger Centre in Cambridge, part of the public consortium. "The Celera approach is more like getting a satellite to take 40 million pictures, throwing them all together and trying to build your map without knowing which part of the world each one comes from."

Imagery, simile and metaphor are illuminating devices for getting across arcane scientific ideas to non-scientists. Even better if this can be combined with a sly hint that your methodology is more elegant and purposeful than someone else's.

Bernard Dixon is former editor of *New Scientist*.